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SOUTH ASIA REGIONAL INITIATIVE FOR ENERGY COOPERATION AND DEVELOPMENT

Ensuring India's Energy Security

EVER-GROWING ENERGY DEMAND

India has a strong appetite for energy. To meet the demands of India's burgeoning population and rapid economic growth, energy needs will increase by 50 per cent in the next 10 years. India needs estimated capacity additions of some 60,700 MW between 2007 and 2012. Moreover, it will need more fuel—oil, gas, and coal—to generate this additional power.

India presently lacks long-term sources of energy that will ensure security, particularly as the gap between energy demand and supply widens over the next decade. As India consumes more energy, many consequences follow. For example, it will need more oil, leading to greater dependence on Middle East oil imports with the attendant price uncertainty and depletion of foreign exchange.

India will also need more gas. Indigenous gas reserves have been boosted by new gas finds in the Krishna-Godavari basin. Even with new gas exploration, India lacks adequate pipelines and terminals to deliver gas to consumers. Inevitably, the gap between demand and supply must be met by continued gas imports via LNG shipments or gas pipelines.

Ensuring energy security also involves addressing power supply issues. Power cuts continue to be a fact of life; the consequence of a mismanaged power sector operated on the basis of political expediency rather than economics. A radical reform of the power sector is required to ensure the needed investment in infrastructure and human resources to provide power supply security.

More than any other single factor, failure to meet its energy needs will impact India's economic growth. As one of the world's fastest growing economies, adequate energy supply is vital for India's economic security. Maintaining projected growth rates is important if India is to provide jobs for the millions who enter the job market each year.

SECURING ESSENTIAL FUEL RESOURCES

Relying on domestic energy sources is unlikely to provide adequate energy security. Nor do increased imports automatically ensure security. Rather, diversity and flexibility of supply are essential. India's energy supplies are secure when they are not vulnerable to physical disruption, erratic fluctuations in price and availability, or environmental risks caused by fuel leaks/spills or pipeline/refinery accidents.

Oil Security. As India's need for oil increases, its oil insecurity is not based on the fear of diminished oil supplies but on price volatility and greater dependency on imports. About 65% of India's oil requirements are met by imports, partly the result of higher demand and partly because its oil industry has been unable to produce more oil. By 2010, imports may account for 80 per cent of total consumption.

India's options include diversifying oil imports by looking beyond the Middle East to countries such as Malaysia, Indonesia, or Russia. The global oil industry is volatile. India could invest equity in oil fields overseas to give itself a natural hedge against volatility; ONGC is already doing this. In the short run, the government needs to establish larger oil reserves to cope with sudden crises or shortages. India currently has an operational reserve of only 30 days (with plans to expand to 45 days). For greater security, India should look at improving its own domestic supply by encouraging exploration by multinationals.

Gas Security. Demand for gas will exceed forecasted supply; a shortfall estimated to grow to more than 30 billion cubic meters (bcm) by 2011 if current production levels are maintained (including production from the newly discovered Krishna-Godavari gas field, with estimated annual production of 9 bcm). Additional sources of supply will be needed to meet forecasted demand.

Short term, the growing imbalance between supply and demand will have to be met with the LNG imports that are already occurring. The region possesses generous gas supplies but lacks the massive capital needed for pipeline infrastructure. Increased foreign investment in infrastructure will occur only if the energy sector becomes more commercially appealing.

The Coal Option. India is generously endowed with coal reserves, which currently provides 56 per cent of primary energy. However, even a shortage of this poor quality fuel is projected unless production levels are increased. Coal reserves can meet projected energy demands but, in its current state, the coal industry cannot extract, process, and transport coal in sufficient quantities. Over the past

decade, production has increased at only 3 % per annum, reaching 343 million tonnes in 2001. The major reason for this slow growth is a lack of investment resulting in the use of outdated technology. Few mines employ advanced mining techniques; in fact, some remain relatively unmechanized.

Transporting coal to India's demand centers is a fundamental problem as most of the coal reserves are located far from the major markets, and almost 40% cent is transported to power plants over 900 km away. Coal transportation is dependent on a neglected and over-burdened rail system. Moreover, moving poor quality coal by rail is expensive due to cross-subsidies between freight tariffs and passenger fares as well as the fact that about 40% of the coal typically has no energy content.

Increased production of better quality coal depends on the government reforming the coal sector to attract private investment. Without this investment, the country's power needs will have to be met with increased levels of imported steam coal.

INFRASTRUCTURE INVESTMENT

India's current infrastructure—railways, ports, and pipelines—cannot meet the demand that extra energy imports will impose over the next 10 years. Substantial investment will be required to meet expansion needs. India will need to look for foreign investment, which will depend on its ability to successfully reform the energy sector.

Energy infrastructure is particularly important owing to an imbalance between the location of energy sources in India and their markets, and distances between import locations and demand centers are considerable. Because India will be importing more crude oil, coal, and natural gas in the future, it will need improved ports and additional pipelines. Existing marine facilities are already struggling to cope with current volumes and additional imports will impose further strain.

POWER SECTOR REFORM

India lacks security of supply in the power sector. Much of the country is afflicted with power shortages/cuts at peak times. Most of the state-run state electricity boards are insolvent—partly because local politicians compel them to supply free or heavily subsidized power—a situation that will not attract private investors. Inadequate investment has greatly damaged the power sector. Wholesale reform of the power sector has been much talked about for the past decade but not enough has been done to put it on a true commercial footing.

The combination of uneconomic tariffs, T&D losses of over 40 per cent, numerous cross-subsidies, and power theft have resulted in substantial arrears for most state electricity boards. Consequently, the state boards lack funds to improve the system. It will be difficult for India to achieve energy security of supply without a radical restructuring of the boards; they need to be privatized, tariffs need to be drastically revised, and independent regulators should be fully supported in carrying out their new responsibilities under the Electricity Act, 2003. As determined by the regulators, commercial pricing will result in more efficient energy use in meeting demand.

India's Energy Security—Issues and Recommendations by Sector

OIL	GAS	COAL	RENEWBLES	POWER SECTOR
ISSUES				
As dependence on crude oil imports increase, diversifying import sources is critical.	Consumer ability to pay for gas is critical when other fuels are available at lower cost. Sound, transparent fuel pricing structures, free from government interference, and unbiased regulatory environment are crucial.	To increase domestic coal production, coal sector reform is essential to make private sector investment attractive and improve production/upgrade facilities.	Renewable energy is relatively costly, and will be difficult to justify in India, which has many calls on very limited investment capital.	Essential actions include radical power sector reform (pricing reform, restructuring, proper regulatory regime, and eliminating government ownership). Sector needs to become more investor-friendly to secure needed investment capital.
RCOMMENDATIONS				
• Invest in crude oil reserves overseas to provide natural hedge against volatility • Establish strategic oil reserve to dampen short term volatility • Enhance domestic supply by encouraging international oil companies to explore in India • Manage demand via pricing and fiscal measures to optimize domestic fuel use	• Support gas export/trade programs with neighboring countries • Enhance domestic supply by encouraging global oil companies to explore India • Base power prices (the major gas use) on economics and remove government interference • Eliminate power price subsidies that inhibit gas supply contracts (e.g., Enron at Dabhol)	• Price coal transport based on economics to enhance local coal competitiveness (huge cost of government involvement in rail sector will always constrain coal transport via rail) • Establish transparent energy pricing and even-handed regulation to improve security of long-term coal imports	• Develop limited new hydropower using screening and environmental assessments (more immediate sources would be Nepal and Bhutan) • Develop alternative gas exploitation via assistance from technologically advanced nations (such as the U.S.) with resources to undertake required R&D	• Reduce new capacity additions by shifting load from peak to off-peak via differentiated tariffs • Introduce energy savings by increasing thermal efficiency of older power plants • Encourage inter-connections with adjacent power-rich states such as Nepal (hydroelectric potential of 80,000 MW) and Bhutan (35,000 MW)

South Asia Regional Initiative for
Energy Cooperation and Development
15 Vasant Marg, Vasant Vihar, New Delhi 110 057
Tel: 91-11-5166-3444
Fax: 91-11- 2615-5122
www.sari-energy.org